character, viz., its inherent tendency to further growth. These, then, are not rudiments, but arrested, reduced, vanishing, or vestigial structures, and should be spoken of as vestiges. Why, because Darwin unfortunately misapplied the word rudimentary, should we necessarily regard this misuse as hallowed, and ever after refuse to use the word in its common sense? To such an extent has this misuse of the word been carried that even encyclopædic dictionaries, after defining the word rudiment in such a manner as to prove that it is the very word we are seeking, as a rendering of the idea expressed by 'Anlage,' give us, under the technical use of the word, "In zoology, a part or organ, the development of which has been arrested (see Vestige)." It would require but little trouble on the part of teachers of biology to reinvest the word rudiment with its proper meaning. By carefully insisting on the use of the words vestigium and vestigial or their equivalents, for all abortive or reduced structures met with in the adult animal, and restricting the terms rudiment and rudimentary to all growing and developing tissues and organs, they could insure this result in a few years."

Ample compensation for the long delay necessitated by the change of translators and the size of the work is furnished in the additional matter in the form of foot-notes and bibliography, an addition without which a work on such a rapidly growing subject as invertebrate embryology would by this time be somewhat antiquated. Many of these foot-notes are valuable and suggestive, but others show a lack of perspective, pardonable, perhaps, in translators who cannot be expected to be familiar with all the bearings of the special matter they are rendering into English. An example of this kind is furnished by the undue importance attributed to Willey's paper on *Peripatus novæ-brittaniæ*. Important this paper undoubtedly is as a description of facts, but one may doubt whether Willey's speculations to the effect that *Peripatus* was originally a viviparous form and that species like *P. oviparus* are secondarily modified in their breeding habits, would have been given so much weight by the critical German authors as to lead them to alter their statement (p. 212) that "although the eggs of some species of *Peripatus* have little, or even no yolk, it is highly probable that they are to be traced back to eggs rich in yolk, like those of *P. novæ-zealandiæ*." Willey unfortunately involved the insect embryo in his speculations and here, too, the translators, without a vestige of critical caution, enthusiastically refer the student to the various homologies of the 'trophoblast.'

Such matters are of little importance, however, and are readily overlooked in the perusal of the flexible English rendering of the admirably lucid German text. The book is an invaluable addition to the collection of handbooks required in every zoological laboratory both in this country and in England.

WILLIAM MORTON WHEELER.

Bulletin of the United States Fish Commission, Vol. XVIII., 1898. By GEORGE M. BOWERS, Commissioner. Washington, Government Printing Office. Pp. 576. Plates 128.

The bound volume of the *Bulletin* for 1898 is the largest, and at the same time one of the most interesting, of the series of eighteen numbers which have appeared since 1881. In a prefatory note, Commissioner Bowers dwells upon the importance of the scientific work that has been carried on by those enjoying the privileges of the biological laboratory at Woods Hole, and his statement that "by affording facilities to those persons who may profit by the use of the material available at its various stations, the Commission not only aids in the general progress of science, but extends its own field of usefulness" will be heartily endorsed both by the many who have already profited by the liberality of the Commission, and by men of science generally.

The first article, beautifully illustrated, is by Commander Moser, now with Mr. Agassiz in the Pacific, and is a report on the operations of the *Albatross* during the summer, autumn, and early winter of 1897. It is a history of the 'Salmon and Salmon Fisheries of Alaska,' told in a straightforward way, and contains historical, geographical and biological data of present interest and of permanent value. Inasmuch as the output of salmon for a single year, 1897,

was about 43,600,000 cans, one does not wonder that the streams of Alaska are becoming depleted. This depletion, already serious, is caused, not by over-fishing alone, but by 'barricading,' a process whereby the fish are actually prevented from ascending the streams to spawn, and are compelled to remain practically impounded in the lower waters, awaiting the pleasure of the packers. Although barricading is punishable by heavy fine and imprisonment, the laws are not enforced, and an industry now yielding $3,000,000 annually is threatened with ultimate extinction.

Dr. Hugh M. Smith, in charge of the scientific work of the Commission, and Mr. Barton A. Bean contribute a paper on 'The Fishes of the District of Columbia.' This and similar faunistic papers that the authors have published elsewhere have proved of great convenience to ichthyologists and local naturalists, and will be of no little assistance to students of geographical distribution. A second paper by Dr. Smith is on 'The Southern Spring Mackerel Fishery of the United States.' The paper gives an account of the history and importance of this fishery. It reviews the reasons for the prohibition of the fishery by Congress, in 1888; it gives an account of the fishery subsequent to the five years of closure, that is, since 1892; and considers certain questions that are suggested by the facts connected with this remarkable, and in many ways exceptional, action of Congress. It is to be regretted that the spring mackerel fishery, since the termination of the closed period, shows no improvement; the catches of the last seven seasons have not paid for the expense of equipping the vessels.

The article on 'The Mussel Fishery and Pearl-Button Industry of the Mississippi River,' by Dr. Smith, contains a description of the mussels used in button-making; a history of the mussel fishery, which has developed into an important industry during the present decade, nearly four thousand tons of shells having been collected by the fishermen of the Mississippi River in 1898; and a statistical review of the button industry, since the time of its establishment in Muscatine, Iowa, in 1891. The article concludes with certain timely recommendations, which, if early adopted by the States concerned, will prevent the destruction of the industry, now threatened by improvidence and avarice.

The eighth article, by Professor C.J. Herrick, is on the 'Peripheral Nervous System of the Bony Fishes.' It is based upon a study of the silverside, and emanates from the biological laboratory of Woods Hole. Since this paper was issued in the form of a reprint, Professor Herrick's magnificent monograph has appeared in the *Journal of Comparative Neurology.*

Another contribution from the government laboratory is made by Dr. Smith, in his 'Notice of a Filefish new to the Fauna of the United States.' A second capture of this filefish (*Alutera monoceros*) was reported in a recent number of SCIENCE. A third contribution from the laboratory is by the reviewer, and is a brief history of the discovery, disappearance, and final reappearance of the tilefish.

The concluding article is by Charles H. Stevenson, on the 'Preservation of Fishery Products for Food.' It covers more than two hundred pages, is amply illustrated, and is exhaustive in its treatment. The methods of retaining, curing, preserving, storing, packing, and shipping fishery products of the most diverse nature are thoroughly discussed by one who has evidently spared no pains to make his paper of real value. H. C. BUMPUS.

BOOKS RECEIVED.

Scientific Papers. JOHN WILLIAM STRUTT, BARON RAYLEIGH. Cambridge University Press, 1899. Vol., I., 1869–1881. Pp. xiv + 562. $5.00.

The Kinetic Theory of Gases. OSKAR EMIL MEYER, translated from the second revised edition by ROBERT E. BAYNES. London, New York and Bombay, Longmans, Green & Co. 1899. Pp. xvi + 472.

An Introduction to Physical Chemistry. JAMES WALKER. London and New York, The Macmillan Company. 1899. Pp. x + 335. $2.50.

Outlines of Industrial Chemistry. FRANK HALL THORPE. New York and London, The Macmillan Company. 1899. New and revised edition. Pp. xvii + 541. $3.50.

Minnesota Plant Life. CONWAY MACMILLAN. St. Paul, Minn. 1899. Pp. xxv + 568.

The World and the Individual. JOSIAH ROYCE. Gifford lectures delivered before the University of Aberdeen. New York and London, The Macmillan Company. 1900. Pp. xvi + 588. $3.00.